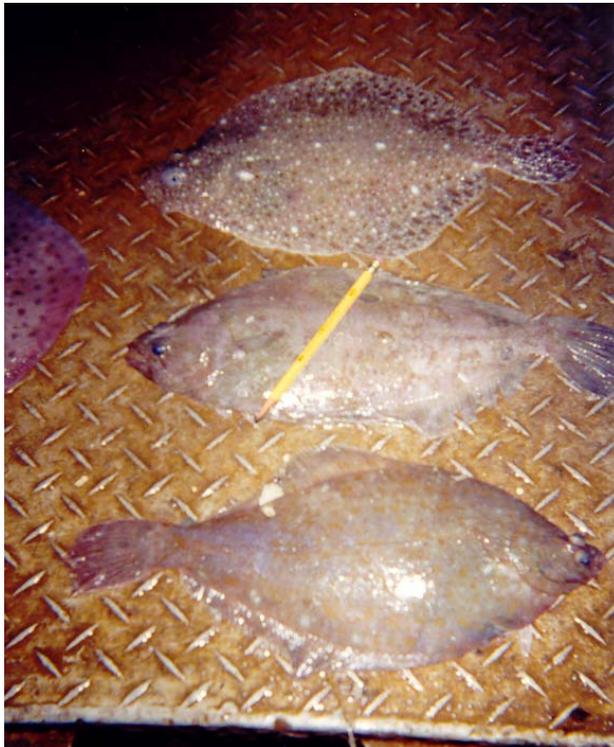


The hard TAC model



Overview

- Purpose
- Data
- Conceptual framework
- Procedure
- Limitations
- Use in prior management actions
- Hard TAC v. math programming

Purpose

The hard TAC model is designed to answer three questions:

1. How long will the fishery last for each TAC-regulated stock?
2. For a given TAC reserve (“threshold”), what would be the appropriate trip limit to prolong the fishery?
3. What additional discards may result from trip limits and retention prohibition?

Data

- 2001 trips as reported in VTRs (needed for spatial component)
- VTR data prorated to dealer data
- Variable costs estimated for:
 - Vessel size (gross tonnage)
 - Gear type (fixed, mobile)
 - Trip duration
- TACs derived from predicted landing streams for various rebuilding strategies

Conceptual framework

- Trip limits induce one of four discrete decisions:
 - Continue fishing as before
 - Stop fishing once limit reached
 - Fail to fish at all
 - *Continue fishing but change strategy*
- Three of four decisions included in model

...to fish or not to fish

When trip limit reached, vessels are assumed to:

- Continue fishing and discard
 - when revenues from non-trip limit limited species plus retained trip limit limited species exceed predicted costs
- Stop fishing
 - when revenues (as above) are negative once the trip limit for any one species is caught (ie., revenues are negative under discarding conditions)
- Fail to fish altogether
 - when the trip limit is caught so fast that revenues for the first day and a half are negative

Adapting the model to the alternatives

- Aggregate landings by week
- Stack weeks in descending order by landings
- Calculate week TAC threshold achieved
- Calculate subsequent trip limits
- Calculate discards under trip limits
- Calculate week TAC achieved
- Calculate discards under zero-retention assumption

Aggregate landings by week

Stack weeks in descending order

Calculate week threshold met

GOM Cod							
wk #	WEEK	e	marker	wk #	WEEK	e	marker
1	6	0.07991	2	14	3	0.82423	2
2	1	0.15596	2	15	48	0.86756	2
3	5	0.22633	2	16	4	0.90833	1
4	33	0.29161	2	17	12	0.94877	1
5	7	0.35649	2	18	10	0.98686	1
6	32	0.41976	2	19	29	1.02223	0
7	35	0.47951	2	20	36	1.05711	0
8	8	0.53439	2	21	30	1.09099	0
9	31	0.58737	2	22	39	1.12443	0
10	9	0.63747	2	23	27	1.15661	0
11	2	0.68617	2	24	13	1.18834	0
12	34	0.73447	2	25	47	1.21854	0
13	11	0.78064	2	26	40	1.24797	0

Calculating fishery duration

- Each trip given an identifier if it:
 - Occurs with discards
 - Occurs without discards
 - Does not occur at all
- Catch for all trips occurring is summed
- When the TAC threshold is reached, trip limits take effect
- Once TAC achieved, the stock area is either closed or possession of that stock is prohibited

Calculating trip limits

- FY 2001 VTR days absent on each stock (total DA less than 0.1% of used DAS)
- Reduce observed DA by 1/3, equivalent to FY 2004 DAS allocations
- Divide the post-threshold TAC by the estimated DAS remaining on that stock

Stock	2001 Landings	04 TAC	Threshold	Weeks to threshold	Month Threshold Achieved	# DAS on stock	# DAS to threshold	Remaining DAS on stock	Trip limit (per day)
GOM cod	4,898	2,663	1,864	11	July	30,380	10,259	20,121	150 lbs

Calculating discards

Discards equal the sum of 2001 observed landings in excess of trip limits on trips occurring



Trip limit (per day)	Total landed after TL	Total discards	Week TAC achieved	Month TAC Achieved	# Trips under trip limit on stock	# Trips w/ discards	# Trips not taken
150 lbs	838	1,418	22	Sept	7,215	5,065	2,423

Limitations

- Single-stock basis does not account for:
 - trips fishing in areas where multiple thresholds have been reached (i.e. reaching trip limits on multiple stocks simultaneously)
 - impacts of stock area closures (e.g. CCGOM yellowtail)
- Assumes no behavioral change:
 - fishing strategies assumed consistent under trip limits
- Resource availability issues:
 - stacking weeks by total landings may overestimate impact of derby if product not available
- Derby impacts may be *underestimated* if more vessels target specific stocks at beginning of FY or trimester

Use of model in prior management actions

- Am 12 to the groundfish FMP for the whiting fishery (2001)
- FW 1 to the monkfish FMP (2001)
- Used to calculate discards for GOM cod SAW (2001)
- Am 13 to the groundfish FMP (2001-2003; used in development of trip limit options)
- Ongoing analysis of dogfish actions

Public presentations of model

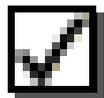
- SSAC review (2001)
- NA Fisheries Economics Association (2001)
- NEFMC Groundfish Ctte (2002, 2003)

Math programming model

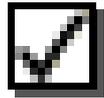
- Designed to estimate Δ 's in F resulting from spatial changes in fishing effort
- Non-linear programming based
- Models IQ as opposed to fleet-wide TAC
- Estimates short-term revenue change and distributional impacts

Hard TAC v. math programming (con't)

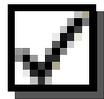
Hard TAC



- estimate fishery duration



- estimate trip limits?



- estimate discards?



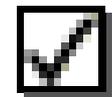
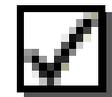
- account for strategy Δ ?



- est. revenue/distributional impacts?

Math

programming



Estimating economic impacts

Revenue change and distributional impacts estimated using mp model for three reasons:

1. Consistency of results
2. MP limitations not as significant for econ impacts
3. MP model better suited for multiple simultaneous regulatory instruments

Summary

- Hard TAC model specifically designed for A13 measures
- Estimates fishery duration, trip limits and discards
- Used in previous management actions
- MP model unable to meet three objectives
- MP model able to estimate econ impacts

